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Whether the lac is to be considered as an excretion or secretion is very much a matter of definition. If by secretion we mean a definite substance elaborated by the organism for a definite purpose, this would appear to be a true secretion. On the other hand, once secreted it probably exerts no further internal function in the organism, and is in so far an excretion. In the same sense, hair, nails, epidermis, etc., continually discarded by the organism, might be considered excretions. However we may regard it, it is probably a normal product of the vital activity of the lac insect.

A somewhat striking objection against this theory is, that it is against analogy, that a well-marked resin should be the product of animal life. But so also is the production of *wax* by the bee against the same analogy, and yet it has been proven that bees confined to an exclusive diet of sugar will produce wax formed by their own vital processes, and any philosophical distinction between *wax* and *resin* in *this* particular would, I think, be difficult to establish.

In conclusion, I would again reiterate that I am by no means certain that the question of the origin of the lac has not been settled by observers more directly interested in natural history, but if so, our chemists and encyclopædists have been slow to find out the facts, and our most recent authorities, with few exceptions, adhere to the exudation theory. If this communication has the effect of bringing to notice previous work, or gives rise to more complete investigations in the future, it will be as much as I can expect from it.

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## BOTANIZING ON THE COLORADO DESERT.

BY EDWARD LEE GREENE.

### I.

IN February of 1877, by way of the stage road between San Diego and Fort Yuma, I made a little expedition across the interesting region above named. A desert is not naturally supposed to be the most eligible locality, nor midwinter the best season for making botanical excursions, yet seldom has a week's recreation of that kind given me more satisfaction than that upon which I have preserved the following notes:

In passing from west to east across Southern California, the

first glimpse one gets of the desert is a fine bird's-eye view. From the San Diego plains, all treeless, brown and dusty, an easy two days' journey brings the traveler up to the level of that broad plateau which constitutes the summit of the coast range. Across this forty-five miles of mountain top, one travels pleasantly; now through handsome groves of evergreen oaks, then among a succession of low, rounded, stony hills, between which some bits of fresh, green mountain pasture spread themselves; here passing a settler's cabin with its newly ploughed fields and its group of blooming peach trees, and there meeting a merry, boisterous gang of mountain herdsmen. Having thus come to the eastern verge of the plateau, the great wilderness breaks all at once upon the view, beginning a dizzy half mile down beneath your feet, and stretching away to the eastward for a hundred miles. It was past the middle of the afternoon when I reached this interesting point, and paused to rest a while and to enjoy the novel scene, so desolately grand, which lay before me. The region in question is far from being a flat monotonous expanse of naked sands.

Its general level is broken by many abruptly rising knobs and peaks and by several prolonged chains of high and sharply defined rocky hills, all lifting themselves up like precipitous islands above the even surface of a sea; and although these peaks and ranges are destitute of verdure, and red as the sands that drift about their bases, they yet combine to make a most impressive picture when viewed at a distance, and from this aerial elevation where the desert first appears in sight. Aware that the stage station where I must pass the night was not more than two miles away by the steep, winding road, I lingered here until the sun was near his setting, and the shadows of the peaks and pyramids I sat among, were measuring their dark lengths upon the plain afar below, and the purple evening clouds had reflected their own almost gorgeous coloring to the vast, varied landscape that stretched eastward and northward so very far away. This strange sunset scene was beautiful beyond all description, and will be treasured for a lifetime in the beholder's memory.

Having descended from these picturesque heights, it was nearly dark when, as the road led around a sharp angle of the mountain, I found myself almost at the door of the stage company's little hotel. Here were pleasant sounds; the music of water trickling

down through an iron pipe from a small spring that rises among rocks which almost overhang the house hundreds of feet above; and by the way, the sound of running water is never so musical as when one has traveled six hours in torrid heat without having tasted a drop. Music also of insects was here, evidently some sort of bees which, even in the late twilight, were humming amid the rosy, flower-laden boughs of the desert almond. This handsome bush (*Prunus andersonii* Gray), when in flower, resembling a small peach tree, contrasts very prettily with its associates, the cacti and agaves which thrust forth their clumsy, graceless forms from every niche and crevice of this grand mass of rock which walls in the desert on the west. While most trees and bushes of that genus require good soil and a fair supply of moisture, this species appears to thrive, like the spiny cacti, on nothing more substantial than the sunburnt rocks and the desert air.

The condition in which I found the solitary tenant of this isolated hostelry illustrates one of many dangers to which the lone keepers of these desert stations are exposed. He was bending over a basin of water bathing his head and face, which parts, as I could see by what remained of daylight, were bleeding freely. He seemed in too much pain to notice the near approach of the stranger, at whose unexpected presence the man's sole household companion, a fierce bull-dog, tugged away at the end of the chain in a rage which I should not have smiled at had the chain been a light one. Presently, however, the man tied a bandage about his head, unbent himself, turned toward the door where I was standing, and I inquired what had befallen him. He replied that he had, a few moments previous to my coming, gathered himself up from the stable floor where he had been lying unconscious he hardly knew how long, having been kicked by a vicious stage horse left in his keeping. Luckily for him and somewhat so for me, tired and hungry as I was, the wound was not serious. He was an intelligent youth, intelligent enough to comprehend my reason for undertaking a walk across the desert. Under his cabin roof I fared well, and on the hardest of beds enjoyed such sound, refreshing sleep as is given to tired but happy travelers.

From this hostelry among the cliffs, a few minutes' morning walk brought me to where the mountain flanks are parted by a deep gorge indicating where, in times long past, a river made its way from the highlands down to the sea which then occupied the

area now a desert. The road here descends to the dry bed of the extinct river, and follows it directly to the plain. The grade is easy but the loose white sand is deep, and in this sandy rock-walled passage I met two Indians, a man and woman, whose decrepid forms, withered features and whitened hair made them look almost prehistoric, toiling upward on foot, each with a heavy pack of blankets and pottery on their backs, while a few rods behind them a stalwart youth of about thirty years rode in serenest laziness a half-starved looking pony. It was probably another party of herborizers this, on their way up to the rocky heights where the wild maguey plants grow, to feast on the tenderly springing flower-stalks, and make mezcal.

February days in this region are nearly as warm as days of July in New England, and as I walked along the south wall of the cañon, gratefully sheltered from the heat of the morning sun, I easily comprehended the origin of that oriental phrase: "The shadow of a great rock in a weary land." Here at my feet, where the sand was shaded, grew and bloomed a low spreading variety of evening primrose (*Enothera*), with large, pale yellow flowers. On the opposite side, more exposed to the sun, the whole base-line of the rising cliffs was ornamented with a continuous hedge-row of a very handsome shrub (*Hyptis albida* H. B. K.) with whitish foliage, its branchlets ending in slender spikes of fine, deep purple flowers. The desert shrubs, however brilliant their flowers may be, are usually without much show of foliage, most of them bearing spines or briars instead of leaves.

But besides this pretty, white-leaved *Hyptis*, I noticed one other exception to that rule in the case of a smaller bush (*Beloperone californica* Gray), the stems of which were buried half their length in the drifting sands, and whose salvia-like spikes of scarlet flowers were subtended by neat foliage of a bright shining green. From admiring these first beauties of the desert, my attention was next drawn to a tuft of tall, slender, reed-like stems with pale-green bark which, though appearing wholly leafless, produced at their summits several pendant clusters of white flowers. At a few rods distance one would never have guessed this graceful plant to be a near relative of the stout coarse leaved silk-weed of Eastern fields and waysides; but a glance at the structure of the flower showed the plant to be a genuine *Asclepias* (*A. subulata* Dec.). The stems, though altogether smooth

and reed-like as seen at a distance, show distinctly, to the nearer view, the nodes at which, in other species of the genus, broad, flaunting leaves are developed, and at each of these leaf-nodes the careful observer detects a pair of minute, awl-shaped appendages which are technically the leaves of this anomalous Asclepiad of the desert.

On passing forth from the mountain gorge to the open plain, the eye is greeted by an assemblage of such strange-looking vegetable forms as command the wondering attention of all travelers, whether scientists or not. Among these the cacti are the most conspicuous; some of them globose or cylindrical, resembling so many enormous melons set up on end, having prickly sides and bearing flowers and fruits at the top. Others are more like orchard trees, with smoothish trunks and well-rounded heads of branches bending under a load of pear-shaped fruits.

One of these cacti (*Opuntia bigelowii* Engelm.) is, in its general aspect, doubtless a more forbidding thing than any "thorn" or "thistle" which the ancestral fugitives from Eden ever met with in oriental wilds. If the reader wishes to form a definite and tolerably correct idea of this plant's appearance, let him imagine a post four or five feet high and as many inches thick, putting forth, from its upper extremity, a half dozen clumsy arms or branches of the size and shape of ordinary ball-clubs, the trunk and club-shaped branches all so thickly beset with long, needle-like, glistening spines, that the spines are actually the only part of the plant visible. With such a horrid growth as this the grand knolls and lower slopes of all the hills are covered.

Extremely odd looking and not more odd than beautiful is the small tree locally known by its Mexican name ocotilla (*Fouquieria splendens* Engelm.). It grows to the height of from eight to twelve feet, and in outline is quite precisely fan-shaped. To show how this may be, let me describe more particularly its mode of growth. The proper trunk, usually ten or twelve inches in diameter, is not more than a foot and a-half high. At just a few inches above the surface of the sands this trunk abruptly separates into a dozen or more distinct and almost branchless stems. These simple stems rising to the height of eight or ten feet, gradually diverge from one another, giving to the whole shrub the outline of a spread fan. Each separate stem is clothed throughout with short gray thorns and small dark-green leaves,

and terminates in a spike a foot long of bright-scarlet, trumpet-shaped flowers. This splendid oddity flourishes in great abundance in many places.

The stems are not so thickly armed with thorns but that a man may handle them if he will seize them circumspectly with his fingers, and being very hard and durable, as well as of a convenient size, they are much employed for fencing purposes about the stage stations and upon the ranches adjoining the desert. Give a skillful Mexican ocotilla poles and plenty of raw hide thongs, and he requires neither nail nor hammer to construct a line of fence which for combined strength, neatness and durability fairly rivals the best work of that kind done in our land of saw mills and nail factories. As a tree or shrub of strange peculiar beauty, the cultivators will vainly desire to add this to their list of varieties, unless their art can reproduce the parched and sterile gravel heaps and the dry, withering atmosphere which it finds congenial. Those who have ever experienced anything of a naturalist's enthusiasm will readily believe that the writer, in passing amid these and other unmentioned objects of thrilling interest, hardly felt the intensity of the mid-day heat, nor realized how much he was suffering from thirst until, at two o'clock, almost before he had thought of such a place or wished it near, he found himself but a few rods away from the station of Coyote Wells. This is the westernmost stopping place on the desert, only twelve miles out from the base of the mountains. The place derives its name from the fact that here the Coyotes, long before ever white men had passed this way, smelled water near the surface, and pawed in the sands until they reached it. These wells of the Coyotes having been suitably excavated and curbed up, supply the best water that has been found on all the breadth of the desert; the other wells being more or less strongly impregnated with offensive salts or alkalies. Having reached the shade of an adobe wall, I gladly took refuge from the heat, and for something less than an hour, did little but drink water. Dinner was then announced, after which I sought again the shade outside, rested, and studied for another hour the rugged outline of a mountain range which broke the level of the plain some ten miles to the northward. The station keeper was going to remove thither some day to settle and dig gold; plenty of the precious metal there; no doubt about it. Only a few years ago a white man and a negro had gone there to dwell to-

gether and amass each his fortune. A late party of prospectors passing that way had found the white man's bones whitening among the sun-burnt rocks. The conclusion was that the negro had murdered his partner and absconded with the accumulated gains of both. And with many such cheerful and edifying bits of history do they seek to beguile the time which weary travelers spend at these desolate halting places in the wilderness.

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## EDITORS' TABLE.

EDITORS: A. S. PACKARD, JR., AND E. D. COPE.

— Whenever an institution accepts a bequest designed to assist impecunious but worthy students in the acquisition of some useful kind of knowledge, such as natural history, its obligations to itself, the donor and beneficiaries of the gift, are plainly that it must, under the direction of a competent committee, see that the donated funds are applied to the objects for which they were given. Such bequests render the institutions accepting them, *charitable*, and if in addition the bequest is for the purpose of enabling any particular class of persons to acquire a specific kind of knowledge, the institution becomes *educational* in the same sense that any special school is considered to be such. Under no ordinary circumstances can the governing body in charge of such a trust, neglect the duty of ascertaining whether the persons directly in charge of the incumbent beneficiaries, do their duty, and whether the beneficiaries themselves are competent persons who are making the proper progress under the proper discipline. Otherwise there is room for maladministration under unauthorized authority; or, the beneficiaries with no direction, under no discipline or instruction, fritter away their time in fruitless effort, at a period of life when they can ill afford to lose it.

The Academy of Natural Sciences, of Philadelphia, some years ago accepted a trust of this kind. Mr. A. E. Jessup's children, out of dutiful regard for their father's wishes, gave the society a sum in trust, the income of which was designed for the benefit of impecunious young men who desired to devote the whole of their time and energies to the pursuit of natural science. The desire to give a sum of money for such a purpose in a man like Mr. Jessup was a natural one, which probably took its rise in the recollection